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10 Bankside, The Watermark Gateshead NE11 9SY	Caterpillar UK Ltd Desford Car Park 3	
Date 05/09/2025 12:45 File Car Park 3.MDX	Designed by MQ Checked by SH	
Micro Drainage	Network 2020.1	

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	3
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.400		

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Storage Structures for Storm

Porous Car Park Manhole: 1, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	20.5
Max Percolation (l/s)	56.9	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	126.510	Membrane Depth (mm)	0

Porous Car Park Manhole: 3, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	33.8
Max Percolation (l/s)	93.9	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	126.510	Membrane Depth (mm)	0

Porous Car Park Manhole: 4, DS/PN: 3.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	18.2
Max Percolation (l/s)	50.6	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	126.510	Membrane Depth (mm)	0

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Micro Drainage

Network 2020.1

Micro Drainage

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0

MADD Factor * 10m³/ha Storage 2.000

Hot Start Level (mm) 0

Inlet Coeffiecient 0.800

Manhole Headloss Coeff (Global) 0.500

Flow per Person per Day (l/per/day) 0.000

Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 3

Number of Online Controls 0

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR

Ratio R 0.400

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 20.000

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status OFF

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 45

US/MH

PN

Name

Storm

Return Period

Climate Change

First (X) Surge

First (Y) Flood

First (Z) Overflow

Overflow Act.

1.000

1 15 Winter

1

+0%

30/15 Summer

1.001

2 15 Winter

1

+0%

1/15 Summer

100/15 Summer

2.000

3 15 Winter

1

+0%

30/15 Summer

3.000

4 15 Winter

1

+0%

30/15 Summer

3.001

5 30 Winter

1

+0%

1/15 Summer

1.002

4 30 Winter

1

+0%

1/15 Summer

Water

US/MH

Level

Surcharged

Flooded

Flow / Overflow

Half Drain

Pipe

PN

Name

(m)

Depth

Volume

Cap.

(l/s)

(mins)

Flow

Status

1.000

1 126.408

-0.092

0.000

0.28

6

5.2

OK

1.001

2 126.309

0.419

0.000

0.55

8.8

SURCHARGED

2.000

3 126.418

-0.082

0.000

0.37

6

7.7

OK

3.000

4 126.399

-0.101

0.000

0.23

6

6.7

OK

3.001

5 126.297

0.407

0.000

0.48

6.4

SURCHARGED

1.002

4 126.262

0.122

0.000

1.58

20.9

SURCHARGED

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Date 05/09/2025 12:45 File Car Park 3.MDX	Designed by MQ Checked by SH																									
Micro Drainage	Network 2020.1																									
<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>																										
<table><tr><td></td><td>US/MH</td><td>Level</td></tr><tr><td>PN</td><td>Name</td><td>Exceeded</td></tr><tr><td>1.000</td><td>1</td><td></td></tr><tr><td>1.001</td><td>2</td><td>1</td></tr><tr><td>2.000</td><td>3</td><td></td></tr><tr><td>3.000</td><td>4</td><td></td></tr><tr><td>3.001</td><td>5</td><td></td></tr><tr><td>1.002</td><td>4</td><td></td></tr></table>				US/MH	Level	PN	Name	Exceeded	1.000	1		1.001	2	1	2.000	3		3.000	4		3.001	5		1.002	4	
	US/MH	Level																								
PN	Name	Exceeded																								
1.000	1																									
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Micro Drainage

Network 2020.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0

MADD Factor * 10m³/ha Storage 2.000

Hot Start Level (mm) 0

Inlet Coefficient 0.800

Manhole Headloss Coeff (Global) 0.500

Flow per Person per Day (l/per/day) 0.000

Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 3

Number of Online Controls 0

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR

Ratio R 0.400

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 20.000

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status OFF

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Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 45

US/MH

PN

Name

Storm

Return Period

Climate Change

First (X) Surge

First (Y) Flood

First (Z) Overflow

Overflow Act.

1.000

1 30 Winter

30

+0%

30/15 Summer

1.001

2 15 Winter

30

+0%

1/15 Summer

100/15 Summer

2.000

3 15 Winter

30

+0%

30/15 Summer

3.000

4 30 Winter

30

+0%

30/15 Summer

3.001

5 15 Winter

30

+0%

1/15 Summer

1.002

4 15 Winter

30

+0%

1/15 Summer

Water

US/MH

Level

Surcharged

Flooded

Half Drain

Pipe

PN

Name

(m)

Depth

Volume

Flow / Overflow

Time

Flow

Status

1.000

1 126.598

0.098

0.000

0.48

11

9.1

SURCHARGED

1.001

2 126.733

0.843

0.000

1.11

17.6

SURCHARGED

2.000

3 126.579

0.079

0.000

0.46

7

9.6

SURCHARGED

3.000

4 126.585

0.085

0.000

0.30

9

8.6

SURCHARGED

3.001

5 126.587

0.697

0.000

0.76

10.3

SURCHARGED

1.002

4 126.558

0.418

0.000

2.35

31.0

SURCHARGED

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Date 05/09/2025 12:45 File Car Park 3.MDX	Designed by MQ Checked by SH	
Micro Drainage Network 2020.1		
<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>		
	US/MH Level PN Name Exceeded	
1.000	1	
1.001	2	1
2.000	3	
3.000	4	
3.001	5	
1.002	4	

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Checked by SH

Micro Drainage

Network 2020.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0

MADD Factor * 10m³/ha Storage 2.000

Hot Start Level (mm) 0

Inlet Coefficient 0.800

Manhole Headloss Coeff (Global) 0.500

Flow per Person per Day (l/per/day) 0.000

Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 3

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Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1 30 Winter		100	+45%	30/15 Summer			
1.001	2 15 Summer		100	+45%	1/15 Summer	100/15 Summer		
2.000	3 30 Winter		100	+45%	30/15 Summer			
3.000	4 30 Winter		100	+45%	30/15 Summer			
3.001	5 30 Winter		100	+45%	1/15 Summer			
1.002	4 15 Summer		100	+45%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	1 126.763		0.263	0.000	0.53	20	9.9	FLOOD RISK
1.001	2 127.040		1.150	0.074	1.67		26.7	FLOOD
2.000	3 126.679		0.179	0.000	0.53	18	11.0	SURCHARGED
3.000	4 126.748		0.248	0.000	0.38	16	10.9	FLOOD RISK
3.001	5 126.712		0.822	0.000	0.88		11.8	SURCHARGED
1.002	4 126.658		0.518	0.000	2.57		34.0	SURCHARGED

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